

1. A method of creating graphical network maps, comprising the steps of:
- determining the spatial location of a device;
  - embedding said device spatial location in data transmitted from said device;
  - determining spatial locations of at least one network device through which said data passes;
  - modifying packet information associated with said data to include said network device spatial locations; and,
  - receiving said modified packet and extracting said spatial locations; and
  - illustrating said geographic locations on a map or by other graphical means.
2. A spatial information transmission method for use within and between electronic devices, comprising the steps of:
- obtaining an automatically determined spatial location from an electronic device when said electronic device is capable of such determination;
  - obtaining a spatial location from a user when said electronic device is not capable of automatic spatial location determination and said stored spatial location is not available from said electronic device; and
  - embedding at least one of said spatial locations in communications originating from said electronic device.
3. The spatial information transmission method of Claim 2, further comprising the step of obtaining a stored spatial location from said electronic device when said electronic device is not capable of automatic spatial location determination;
4. The spatial information transmission method of Claim 2, further comprising the step of storing at least one of said spatial locations, wherein said at least one stored spatial location is made available to a plurality of requesters.
5. The spatial information transmission method of Claim 2, wherein said spatial locations include spatial location information and spatial location attributes.

6. The spatial information transmission method of Claim 2, wherein said spatial location is embedded using Multi-purpose Internet Mail Extensions.
7. The spatial information transmission method of Claim 2, wherein said spatial location is included in object identifiers in a Simple Network Management Protocol management information base.
8. The spatial information transmission method of Claim 2, wherein said spatial location is included as a Lightweight Directory Access Protocol object.
9. The spatial information transmission method of Claim 2, wherein said spatial location is embedded within the header of a standard Advanced Research Projects Agency Internet Text Message.
10. The spatial information transmission method of Claim 2, further comprising the step of encoding said spatial location based on an Extensible Markup Language Document Type Definition.
11. A spatial location based reminder method, comprising the steps of:
- storing content;
  - defining a spatial region;
  - allowing a user to associate said spatial region with said content;
  - determining a current spatial location of an electronic device; and
  - presenting content associated with a spatial area to a user when said device is within said spatial region.
12. The spatial location based reminder method of Claim 11, in which said electronic device performs said step of determining said current spatial location.
13. The spatial location based reminder method of Claim 11, in which said spatial region is defined by a spatial location occupied by the device on which said association is created, wherein said spatial region is determined by associating a range with said spatial location.

14. The spatial location based reminder method of Claim 11, in which said content is stored on at least one server communicatively coupled to said electronic device.
15. The spatial location based reminder method of Claim 11, in which said defined spatial regions are stored on at least one server communicatively coupled to said electronic device.
16. The spatial location based reminder method of Claim 11, in which said spatial region and content associations are stored on at least one server communicatively coupled to said electronic device.
17. A spatial location based control method, comprising the steps of:
- creating a command to control a device or system;
  - defining a spatial region;
  - associating said spatial region with said device or system control command;
  - determining a current spatial location of a mobile electronic device; and
  - sending the device or system control command associated with a spatial region to a device when said mobile electronic device is within said spatial region.
18. The spatial location based control method of Claim 17, in which said device or system control command is sent when said mobile electronic device enters said spatial region.
19. The spatial location based control method of Claim 17, further comprising the steps of:
- associating scheduling information with said spatial region and control command associations; and,
  - restricting the sending of device or system control commands associated with said spatial region to dates and times corresponding to said schedule information.
20. The spatial location based control method of Claim 17, in which said mobile electronic device determines its current spatial location.

21. The spatial location based control method of Claim 20, in which said spatial region definition step further comprises activating a user interface element on said electronic device which causes a spatial location to be recorded and associated with a range to create said spatial region.
22. A spatial location based information display and control system which includes a means for defining a user selectable hierarchy of one or more preferred location determination means, wherein said user selectable hierarchy allows users of said spatial location based information display and control system to record spatial locations of interest using a variety of spatial location specification means.
23. A spatial location based content substitution method, comprising the steps of:
- storing content in a database;
  - storing attributes of said content in said database;
  - associating said content with one or more spatial locations;
  - storing said associations in a database;
  - determining the current spatial location of a content presentation device;
  - selecting content from said database based on said content presentation device current location and content attributes; and,
  - presenting said content to a user of said content presentation device in place of default content.
24. The spatial location based content substitution method of Claim 23, further comprising the step of selecting content from said database based on a current date and time, and user behavior patterns.
25. The spatial location based content substitution method of Claim 24, in which said behavior patterns include the duration a user typically stays within a spatial region, and the frequency with which a user visits a given spatial region.
26. The spatial location based content substitution method of Claim 23, in which said content attributes include content duration and content target audience.

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27. The spatial location based content substitution method of Claim 26, in which demographic information relating to a user or owner of said content presentation device is stored in a database, and wherein such demographic information is used in combination with other criteria when selecting content from said database.
28. The spatial location based content substitution method of Claim 23, in which said content and said default content includes advertisements.
29. The spatial location based content substitution method of Claim 23, in which the step of selecting content from said database includes selection of one or more content pieces whose aggregate dimensions are substantially equal to said default content.
30. A spatial location transmission method, comprising the steps of:  
determining a spatial location of interest;  
determining spatial location attributes;  
translating said spatial location of interest and spatial location attributes into at least one standardized format; and  
embedding said translated spatial location into at least one communications protocol component.
31. The spatial location transmission method of Claim 30, in which said communications protocol components comprise communications protocol headers.
32. The spatial location transmission method of Claim 31, in which said embedded, translated spatial locations are transmitted as part of all data transmitted by a device.
33. The spatial location transmission method of Claim 30, in which said at least one communications protocol is comprised of at least one message transfer protocol.
34. The spatial location transmission method of Claim 30, in which said spatial location of interest comprises the current spatial location of a device.
35. The spatial location transmission method of Claim 34, in which said current spatial location of a device is determined automatically.

36. The spatial location transmission method of Claim 30, in which said spatial location attributes utilize the Content Standard for Digital Geospatial Metadata as said standardized format.
37. The spatial location transmission method of Claim 30, in which said standardized format is enhanced to use a standardized vocabulary, thereby facilitating additional automation.
38. The spatial location transmission method of Claim 30, in which additional translated spatial locations indicating the current spatial location of network components devices said data transmitted by a device are embedded by said network components into said data.
39. The spatial location transmission method of Claim 30, further comprising a step of maintaining a database of previous and current spatial locations for various devices, thereby enhancing asset management capabilities.
40. A spatial location based data validation system, comprising:
- a transmitting device capable of automatic spatial location determination;
  - a receiving device capable of receiving a spatial location;
  - a database of recent transmitting device spatial locations;
  - a means of calculating a speed and direction of said transmitting device based on said database of recent transmitting device spatial locations; and
  - a means of determining whether a most recently received transmitting device spatial location is consistent with said calculated speed and direction, within a specified range.
41. A spatial location based data validation method, comprising the steps of:
- determining the current spatial location of a transmitting device;
  - transmitting said transmitting device current location to a receiving device along with other data from said transmitting device;
  - receiving said transmitting device current spatial location;

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storing said transmitting device current spatial location;  
calculating the speed and direction of travel associated with said transmitting device  
based on recently stored current spatial locations for a transmitting device;  
determining whether said transmitting device current location is consistent with said  
calculated transmitting device speed and direction of travel, within a customizable  
error limit; and  
providing positive authentication to said other data from said transmitting device if  
said transmitting device current spatial location is determined to be consistent  
with said calculated transmitting device speed and direction of travel.

42. An automatic spatial location client configuration and service location system,  
comprising:  
a device capable of transmitting a configuration request and receiving local  
configuration information;  
a storage means on said device into which said local configuration information can be  
stored;  
at least one server capable of fulfilling computing services; and  
at least one master server capable of maintaining a list of currently available services  
provided by said at least one server, spatial locations associated with said at least  
one server and said device, and spatial locations served by said at least one server.
43. The automatic spatial location client configuration and service location system of  
Claim 42, wherein said device includes a current spatial location in said  
configuration request.
44. The automatic spatial location client configuration and service location system of  
Claim 42, wherein said local configuration information received by said device  
includes a spatial location.

45. The automatic spatial location client configuration and service location system of Claim 42, wherein said local configuration information includes software to be installed on said device.
46. The automatic spatial location client configuration and service location system of Claim 42, wherein said local configuration information includes specification of a preferred spatial location encoding means and software necessary to implement said preferred spatial location encoding means if said device is not already capable of implementing said preferred spatial location encoding means.
47. An automated network client configuration and service location method, comprising the steps of:
- transmitting a configuration request from a device;
  - receiving and processing said configuration request at a master configuration server;
  - identifying at least one server capable of providing said requested configuration information to said device based in part on said spatial location transmitted by said device;
  - rerouting of said configuration request to said at least one service server;
  - transmitting said requested configuration information to said device from said at least one service server; and
  - storing said requested configuration information on said device.
48. The automated network client configuration and service location method of Claim 47, in which said configuration request includes a spatial location, attributes associated with said spatial location, and attributes associated with said device
49. The automated network client configuration and service location method of Claim 47, in which said requested configuration information includes a list of additional services available from at least one server accessible via the network.
50. The automated network client configuration and service location method of Claim 47, in which said device is capable of automatically determining a current spatial



location, and said current spatial location is included in said configuration information request.

51. A real time, spatial location aware directory system, comprising:

an electronic device which is assigned a unique identifier, and which is capable of reporting a spatial location by embedding said spatial location, said unique identifier, and other information within communications originating from said electronic device;

network infrastructure equipment capable of extracting said spatial location and said unique identifier from said communications originating from said electronic device;

a database communicatively coupled to said network infrastructure equipment which is capable of associating said extracted electronic device identifier and spatial location with information pertaining to an entity owning and operating said electronic device; and

a means of updating spatial location information stored in said database when spatial location information reported by said electronic device changes.

52. The real time, spatial location aware directory system of Claim 51, wherein said electronic device includes a point of sale terminal.

53. The real time, spatial location aware directory system of Claim 51, wherein said information pertaining to an entity owning and operating said electronic device includes the name, address, telephone number, and E-mail address of said entity, wherein said address is updated as said spatial location information reported by said electronic device changes.

54. A method of maintaining a real time, spatial location aware directory which comprises the steps of:

embedding at least one spatial location and attributes associated with an electronic device in communications originating from said electronic device;

monitoring said communications and extracting said spatial location and attributes;  
storing said extracted spatial location and attribute information in a database of  
entities owning said electronic devices, along with additional information  
provided by said entities; and,  
updating said database when said spatial location associated with said electronic  
device changes.

55. The real time spatial location aware directory maintenance method of Claim 54, in  
which said electronic device is a point of sale terminal.
56. The real time spatial location aware directory maintenance method of Claim 54, in  
which said additional information includes the name, address, telephone number, and  
E-mail address of said entity, wherein said address is updated as said spatial location  
associated with said electronic device changes.
57. A method of storing a spatial location associated with a given waypoint, comprising:  
determining a spatial location;  
translating said spatial location into at least one standardized format; and  
storing said translated spatial location as a cookie.
58. A method of building an enhanced directory of available services and devices which  
includes the spatial location of such services and devices, comprising the steps of:  
transmitting a configuration request from a device, wherein said configuration request  
includes a spatial location, attributes associated with said spatial location, and  
attributes associated with said device;  
receiving and processing said configuration request at a master configuration server;  
identifying at least one service servers capable of providing said requested  
configuration information to said device based in part on said spatial location  
transmitted by said device;  
rerouting of said configuration request to said one or more service servers;

transmitting said requested configuration information to said device from said one or more service servers;

storing said requested configuration information on said device.

storing said spatial location, spatial location attributes, device attributes, and assigned configuration information in a database on a server;

allowing other devices to search said database; and,

updating device spatial location and spatial location attribute information on a periodic basis.

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